

PATENT SPECIFICATION**851,636**

NO DRAWINGS.



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COMPLETE SPECIFICATION.**Improvements in or relating to Roof Covering Materials.**

We, RUDEROWWERKE AKTIEN GESELLSCHAFT, of Billbrookdeich 134, Hamburg-Billstedt 1, Germany, a German Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a roof covering made using synthetic resins.

Synthetic resin sheets with or without stiffening carrier layers are used to a considerable extent, for example in the form of paving or sheets for foot path coverings.

The use of such synthetic resin paving as a roof covering material is opposed by considerable difficulties, since their resistance to mechanical and atmospheric attack is not sufficient. Simple unprotected polyethylene is damaged by weathering relatively quickly, namely within about 2 to 3 years, both by a photolytic and also by a concurrent oxidative reaction. The defective light resistance of PVC sheets, which have proved useful as footpath coverings, makes them less suitable for roof covering.

According to the invention, a roof covering comprises a synthetic resin sheet in the form of a strip reinforced by a fabric or fleece insert of organic or inorganic fibres and coated on one side with a dense, rigidly adhering, hard and friction resistant layer of rock fines.

Such a roof covering combines the advantages of synthetic resin sheets, namely high strength and flexibility, with an extremely good weather resistance.

The synthetic resin sheet can be provided with the coating of rock fines either during its manufacture or after its application to the roof. The coating reflects or absorbs

light, prevents direct entry of rain-water and condensation moisture into the synthetic resin sheet, and acts as a sealing layer, and guards the latter to a considerable extent against mechanical damage. The undesirable shrinking of the synthetic resin sheet under the influence of weathering is likewise prevented or considerably diminished by the coating of rock fines. The loading by the heavy weather layer (1.5 to 2.5 kg. of rock fines per sq. metre) further guarantees a better adhesion with the roof supports and a better joining of the synthetic resin sheets, which because of their high elasticity otherwise readily tend to roll up at their cut edges.

The synthetic resin sheet preferably has a basis of PVC, a vinylchloride copolymer, polyethylene, polyisobutylene and polyurethane or a synthetic rubber. Those sheets are especially suitable which can be readily secured by an adhesive. The fabric or fleece insert of organic or inorganic fibres may be glass, felt, paper or jute.

The invention can be carried out with advantage, if the sheet is given a foam structure by the addition thereto of a gas or foam forming substance. In this way, the roof covering can be given good heat insulation properties. Thus if such properties are required, it is not necessary to use a separate heat insulation material. It is recommended that the foamed synthetic resin sheet be fixed to a layer of oil paper, bituminised paper or thin, finely-sanded tar or bitumen roofing felt, so as to increase the stability of the covering and to facilitate the operation of securing it to the roof support. Preferably, the rock fines are coloured by, in particular, metallizing or colouring, e.g., by means of metal bronze powders is to be recommended. In this way, the ability of the rock layer to reflect or absorb the

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chemically active part of the incident light is increased.

The invention is explained below in detail in conjunction with the following examples.

EXAMPLE I.

0.2 to 0.4 mm. thick, plasticised PVC sheets made according to a known process are mechanically coated with a mineral weathering layer which takes the form of a PVC paste, e.g., of 15–30% PVC powder with a K value of 70 to 80, 55–40% of hard coal tar and 30% of mineral fillers with a predominantly fibrous or lamellar particle form and with an excess of naturally coloured or artificially coloured or metallized rock fines, e.g., of a particle size of 0.5 to 2.0 mm, whereupon the coated sheet is treated in a heating vessel in the usual way at about 140° to 160° C.

The applied mineral weathering layer is obtained in a particularly dense and adherent form by the hardening which then occurs.

EXAMPLE II.

Instead of hard coal tar, a synthetic softener is used. Otherwise, the roof covering is made exactly the same as described in Example I. As examples of such synthetic softeners, the following are mentioned:—

Palatinol—The word "Palatinol" is a Registered Trade Mark used for softeners which consist essentially of phthalic acid esters;

Plastomoll—The word "Plastomoll" is a Registered Trade Mark used for softeners which consist of adipic acid esters of hydrated higher cyclic alcohols;

Tricresyl phosphate ($C_6H_5-CH_3$)₃PO₄.

EXAMPLE III.

A PVC sheet according to Example I is coated with an aqueous dispersion of PVC or a copolymer of vinyl chloride and vinyl acetate, e.g., Vestolit dispersions made by the Chemischen Werke Huls (the word "Vestolit" is a Registered Trade Mark) or a Vinnol emulsion of the firm Wacker-Chemie (the word "Vinnol" is a Registered Trade Mark) and is coated according to Example I. After evaporation of the dispersion water and the subsequent short gelling on a calender or in a heating vessel, a weather-resistant roof covering material is obtained.

EXAMPLE IV.

A PVC sheet according to Example I is covered with an aqueous dispersion of thoroughly plasticised, water-resistant polyvinylacetate, coated as in Example I, treated with hot air or sent to a heating vessel for evaporation of the dispersion water.

EXAMPLE V.

A sheet of polyisobutylene is treated according to Example I.

EXAMPLE VI.

A sheet of polyisobutylene is coated after being laid on the roof with a hot or cold adhesive, whose binding agent consists of bitumen or a mixture of bitumen and polyisobutylene. Additionally, it is coated with an excess of rock fines and metal bronze. After cooling of the adhesive or after evaporation of the main amount of its solvent, the coating is rolled in and the excess brushed off.

EXAMPLE VII.

A rigid or rollable synthetic foam material manufactured according to a known method from polystyrene, polyurethane, PVC or synthetic rubber is coated with a viscous aqueous dispersion of thoroughly plasticised polyvinylacetate for example, the material sold by Wacker-Chemie under the name Vinnapas 56/44 (the word "Vinnapas" is a Registered Trade Mark), by means of a coating machine or is applied to the roof by means of a brush and is then covered with rock fines according to Example I or with rock fines coloured by metal bronze or metal grindings and is lightly rolled. After evaporation or removal of the dispersion water, a water-resistant, firmly-adhering, dense weathering layer is obtained.

In order to increase the stability of the roof covering so made and to facilitate its securement to the roof support, the foam synthetic resin covering can be secured, for example, by means of an aqueous dispersion of thoroughly plasticised polyvinylacetate, to a support of oiled paper, bituminized paper or thin, finely-sanded tar or bitumen roofing felt. This can be effected at the time of the application of the weathering layer. The rock fines consist, in known manner, of sand grinding dust, basalt or ground stone.

WHAT WE CLAIM IS:—

1. A roof covering comprising a synthetic resin sheet in the form of a strip reinforced by a fabric or fleece insert of organic or inorganic fibres and coated on one side with a dense, rigidly adhering hard and friction-resistant layer of rock fines.
2. A roof covering according to Claim 1 in which the synthetic resin sheet comprises polyvinylchloride.
3. A roof covering according to Claim 1 in which the synthetic resin sheet comprises a vinylchloride copolymer.
4. A roof covering according to Claim 1 in which the synthetic resin sheet comprises polyethylene.
5. A roof covering according to Claim 1 in which the synthetic resin sheet comprises polyisobutylene.
6. A roof covering according to Claim 1 in which the synthetic resin sheet comprises polyurethane.
7. A roof covering according to Claim 1

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- in which the synthetic resin sheet comprises synthetic rubber.
8. A roof covering according to any preceding claim in which the synthetic resin sheet has been given a foam structure by the addition of a gas or foam forming material thereto.
9. A roof covering according to Claim 8 in which the foamed synthetic resin material is secured using an aqueous dispersion of thoroughly plasticised polyvinyl acetate to a support of oiled paper.
10. A roof covering according to Claim 8 in which the foamed synthetic resin material is secured using an aqueous dispersion of thoroughly plasticised polyvinyl acetate to a support of bituminised paper.
11. A roof covering according to Claim 8 in which the foamed synthetic resin material is secured using an aqueous dispersion of thoroughly plasticised polyvinyl acetate to a support of thin, finely sanded tarred roofing felt.
12. A roof covering according to Claim 8 in which the foamed synthetic resin material is secured using an aqueous dispersion of thoroughly plasticised polyvinyl acetate to a support of bitumen roofing felt.
13. A roof covering according to any preceding claim in which the rock fines are coloured.
14. A roof covering according to Claim 13 in which the rock fines are coloured by metallizing.
15. A roof covering according to Claim 13 in which the rock fines are coloured by metal bronzes.
16. A roof covering substantially as described with reference to the foregoing examples.
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